relative to said variation in said one or more fabrication or operational parameters associated with said integrated circuit substrate.

REMARKS

Claims 19-21, 65-67 and 72-79 were rejected under 35 U.S.C. § 103 as unpatentable over Magar, U.S. Patent 4,503,500, in view of newly cited Pelgrom et al., U.S. Patent 4,627,082. In response, the independent claims have been rewritten to specify that the entire ring oscillator variable speed system clock, variable speed clock or oscillator be provided in the integrated circuit, in order to sharpen the distinction over the prior art. Because the prior art does not provide an entire ring oscillator variable speed system clock, variable speed clock or oscillator in the integrated circuit, in that the prior art circuits require an external crystal, the prior art fails to teach or suggest the invention as now claimed. This rejection is believed to be overcome by these changes to the claims and these remarks.

Shortly before this Office Action was mailed, Mr. George Shaw, the Assignee's technical representative, and the undersigned attorney had a phone interview with the Examiner regarding this and another of Assignee's cases. Technical distinctions of the present case over the Magar reference previously cited were discussed, as well as the benefits of the invention. Below is recited the pertinent points of that discussion, as well as rebuttal to the new Pelgrom reference.

First, the Examiner states "Pelgrom teaches that electronic components would exhibit same characteristics if they are manufactured by the same process technology", and applicant agrees that this is well known in the art. The Examiner states that, "Since Pelgrom's [Magar's?] microprocessor is made of electronic components, it would have obvious, from the teaching of Pelgrom, to a person of ordinary skill in the art to have the components of Magar' microprocessor and clock (oscillator) make of the same process for ensuring processing frequency of the cpu to track the clock rate in response to the parameter variations." Applicant agrees that the processing frequency capability of the CPU would track the clock rate capability of the clock generator, as this is controlled by the laws of physics on which the Pelgrom reference is based. However, there would be no "tracking" of the clock rate produced by the Magar clock generator, because the entire circuit is not provided on the integrated circuit. Magar's clock generator relies on an external crystal connected to terminals X1 and X2 to oscillate, as is conventional in microprocessor designs. It is not an entire oscillator in itself. And with the crystal, the clock rate generated is also conventional in that it is at a fixed, not a variable, frequency. The Magar clock is comparable in operation to the conventional crystal clock 434 depicted in Fig. 17 of the present application for controlling the I/O interface at a fixed rate frequency, and not at all like the clock on which the claims are based, as has been previously stated.

The Examiner also states that "applicants contend that Magar's clock is external to the IC." This is not the case. The "clock gen" part of the oscillator circuit is clearly on the IC, but not the crystal. Applicants note that the crystal is external, connected to X1 and X2, as Magar cites at column 15, lines 26-27,

"The chip 10 includes a clock generator 17 which has two external pins X1 and X2 to which a crystal (or external generator) is connected."

Thus while most of Magar's clock (generator) circuitry is on the IC, the entire oscillator, which because it requires an external crystal, is not.

"The Examiner further states that applicants imply a "correspondence" in application between Applicant's clock 434 and Magar's clock. This is not the case. Applicants only state that the two clocks are "of the same general type" or are "equivalent" at the circuit level, in that they both use an external crystal to fix the clock rate. They are both of conventional design and not the subject of the claims in the instant case. Clearly, either type could be used to drive a CPU, as Magar depicts the conventional case and Applicant depicts a unique design which provides a variable clock frequency or rate.

Applicant's prior comments apparently did not make clear the distinction between an oscillator and a clock as it applies to the Magar reference. As a self-contained on-chip circuit, Magar's clock gen is distinguished from an oscillator in at least that it lacks the crystal or external generator that it requires. Thus Magar's circuit is not an entirely on-chip oscillator as contemplated in the present case, it is only a clock.

As mentioned in Applicant's previous remarks, the term clock is sometimes used interchangeably with oscillator, even inappropriately, leading to confusion. And, adding to the confusion, in the instant case, 430 is both an oscillator and a clock in the conventional senses. It is an oscillator in that it oscillates without external components (unlike the Magar reference). An example of such an oscillator circuit which does not utililze external components is given in Fig. 18 of the present application. It is also a clock in Magar reference sense in that it produces the various required timing signals needed of the CPU. The signals PHASE 0, PHASE 1, PHASE 2, and PHASE 3 in Applicant's Fig 18 are synonymous with Q1, Q2, Q3, and Q4 depicted in Magar Fig. 2a. The essential difference is that the frequency or rate of the PHASE 0, PHASE 1, PHASE 2, and PHASE 3 signals is determined by the processing and/or operating parameters of the integrated circuit containing the Fig. 18 circuit, while the frequency or rate of the Q1, Q2, Q3, and Q4 signals depicted in Magar Fig. 2a are determined by the fixed frequency of the external crystal connected to the circuit portion outputting the Q1, Q2, Q3, and Q4 signals shown in Magar Fig. 2a.

To summarize, the Pelgrom reference teaches well known art as one of the fundamental principles on which IC are designed. If components did not vary in a similar manner circuit performance could not be predicted and ICs could not be designed. This does not negate

patentability in the present case because it is not the fundamental principle that is claimed but the combination in light of the fundamental principle of enumerated heretofore uncombined circuits to produce a result not obtained with the prior art that is the subject of the claims in the instant case. The Magar teaching is well known in the art as a conventional crystal controlled oscillator. It is specifically distinguished from the instant case in that it is both fixed-frequency (being crystal based) and requires an external crystal or external frequency generator.

Based on the above changes to the claims and remarks, the rejection under 35 USC § 103 is believed to be overcome. All of the claims in the application are believed to be patentable over the prior art. This application is believed to be in condition for allowance, and allowance is solicited.

Respectfully submitted,

COOLEY GODWARD LLP

Willis E. Higgins
Reg. No. 23,025

Five Palo Alto Square
Palo Alto, CA 94306-2155
Telephone: (650) 843-5145